REMARKS

This paper is filed in response to the Office Action mailed 1st July 2010. Claims 1-6, 10-14, 16-18, and 20-24 were pending in the application. Of the above claims 13, 14, 16-18 and 20 are withdrawn from consideration but subject to a request of rejoinder upon allowance of the elected claims. Claims 1-6, 11, 21-24 are previously presented. Claims 7-9, 15 and 19 are canceled. Claims 25 and 26 are new. Therefore, claims 1-6, 10-12 and 21-26 are submitted for reconsideration.

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New Claims

Claims 25 and 26 have been added to specify that the polymer adhesive heat-seal layer is a thermoplastic polymer. Basis for this amendment is to be found on page 14, line 1 to line 4 which refers to a PVC/polyacrylate based adhesive. This is a thermoplastic adhesive. It is also understood from page 14, line 12 to line 13 that the adhesive layer is supposed to have a melting temperature at which joining or loosening occurs. This cannot be the case for a thermosetting polymer. No new matter is added by such amendment.

Rejection of Claims 1-6, 10, 11, 21, 23 and 24

Claims 1-6, 10, 11, 21, 23 and 24 were rejected under 35 U.S.C. § 103(a) as being unpatentable in view of Yasutake et al. in combination with Lamich and newly cited document US 5,490,559 to Dinulescu.

The Examiner has indicated that Yasutake discloses a heat exchanger construction having plates formed of a clad brazing sheet that permits furnace brazing. It is stated on page 2 of the official action that "the only limitations of claim 1 that Yasutake lacks is the corrugated form of the fin structure 11, and the recited "polymer adhesive".

It is respectfully pointed out that the very features that are lacking are the underlying inventive features on which the invention relies. Furthermore, not only does Yasutake fail to disclose the polymer adhesive, it also fails to disclose the concept that this adhesive is present in a formable laminate which can be joined to itself (or another similar laminate) to form a flow channel. *"the laminate being sealed under heat and pressure by said adhesive heat-seal layer to itself"* as required by claim 1. In the case of Yasutake, flat plates 2, positioned vertically are separated by spacers 8 (see e.g. col. 6, line45 to line 55). The spacers 8 cannot be considered as the same or "similar laminate" as the plates 2 and do not comprise a heat seal adhesive.

Lamich has previously been discussed – it does disclose a tube having an integral fin formed using brazing techniques but fails to disclose or suggest the presence of a laminate comprising a polymer adhesive heat-seal layer.

The Examiner presently relies on the teaching of Dinulescu as allegedly teaching the substitution of an organic structural adhesive instead of brazing or soldering compounds. We respectfully believe however that this document fails to teach the use of heat-seal adhesives and in fact teaches clearly away from the present invention.

Referring specifically to the polymer taught by Dinulescu, it is noted that this is a particular structural adhesive such as an epoxy-type resin (see column 9, line 57 to line 65). Although the specific resin suggested may not be limiting, this is not a heat-seal adhesive. Furthermore, the disclosure of Dinulescu cannot be considered to cover "a formable laminate of a metal layer and a polymer adhesive heat-seal layer". Dinulescu discloses that the adhesive is spread by brush onto the components to be joined as a liquid (see col. 10, line 10 to line 12).

Most importantly, Dinulescu fundamentally teaches away from the construction as presently claimed whereby a laminate has corrugated fins on both surfaces. According to Dinulescu the object of the invention is to connect fins using a common base plate (see column 5, line 57 to line 64) in order to avoid the line connections typical of corrugated fins (see column 4, line 10 to line 44). The person of ordinary skill, faced with Yasutake and Dinulescu would at most use a base plate type construction to join solid fins to a membrane or wall. There would be no motivation to go against the teaching of Dinulescu and employ corrugated fins as described by Lamich.

Applicant remains of the opinion that the concept of a formable laminate of a polymer adhesive heat seal layer and a metal layer having corrugated fins connected on both surfaces is neither disclosed nor suggested by any of the presently cited art. Not only does such an arrangement provide for flexible and simple manufacturing, it also ensures that the resulting product is protected by the heat seal layer from corrosion.

Based on the above, Applicant respectfully requests the Examiner to reconsider the rejection of claim 1. Similar arguments also apply to claim 21, which relies on the same inventive features.

In addition to claims 1 and 21, further dependent claims are likewise neither anticipated nor reasonably suggested by combinations of Lamich, Dinulescu and Yasutake for the following reasons:

- In the case of claims 2 and 3, Yasutake discloses a plate type heat exchanger having, in the case of Fig. 17 aluminum particles of 20 to 500 micron size (see

col. 6, line 61). The wall 10 and fins 11 are clearly considerably thicker than 120 microns and there is no suggestion that soft annealed aluminum of this thickness would be appropriate (see e.g. col. 3, line 23 to line 28). Dinulescu discloses fins having thicknesses of 200 to 400 microns (see col. 2, line 1 to line 6).

- With respect to claim 4, it may be noted that although Dinulescu teaches use of an adhesive, there would be no reason to provide it in a manner coextensive with the metal layer. Dinulescu uses the adhesive purely to connect the surface packets to the tube walls. It acknowledges that the adhesive has a lower conductivity (see col. 10, line 33 to line 37) and there would therefore be no reason to apply it to other regions as it would decrease the heat transfer capability of the exchanger. Dinulescu considers the possible need for corrosion resistance at col. 11, line 2 to line 5 but solves this by using a corrosion protection primer. It fails to appreciate that the functions of both corrosion protection and joining can be achieved by the use of a polymer adhesive heat seal layer that is coextensive with the metal layer;
- Re claim 5, Dinulescu also fails to suggest the provision of such a laminate having a heat seal layer on both surfaces of a metal layer;
- Re claim 10, even were Dinulescu considered to teach the use of a polymer heat-seal layer, there would be no basis for also including such a layer both on the laminate and on the fins themselves. Dinulescu is concerned with reducing the thickness of adhesive (see col. 10, line 33 to line 41) and having the adhesive on both surfaces would not assist in achieving this objective;
- Yasutake suggests the use of a porous layer of aluminum particles. There is no suggestion that this could be replaced by a fibrous non-woven material, adhesively laminated to the fins. The aluminum layer in Yasutake is applied in a brazing process (see col. 6, line 51 to col. 7, line 25) which is also used to connect the fins and plates together and it would appear most unsuitable to include fibrous material which would prevent the components from connecting (see col. 7, line 13 to line 17);
- New claims 25 and 26 require that the polymeric layer is a thermoplastic layer. For the avoidance of doubt, Dinulescu discloses use of <u>thermosetting</u> adhesives. There is no suggestion that the adhesives used should soften when exposed to heat as that would be detrimental to the intended use. The presently claimed invention requires a <u>formable</u> laminate that can be joined by heat and pressure. Manufacture of such a heat exchange element requires a laminate that remains flexible. Thermoplastic adhesive coated metal laminates can be manufactured in this way

and retain their flexibility. In this manner, the resulting heat exchange element is less susceptible to cracking or breaking due to forces applied e.g. to the fins.

For these reasons, reconsideration of claims 2-6, 10-13 and 22 - 26 is respectfully requested.

Rejoinder of claims 14, 16-18 and 20 upon allowance of elected claims

Claim 13 is dependent upon claim 1 and rejoinder of this claim is deemed appropriate.

Claim 14 also explicitly relies upon the same features as claim 1, in particular, the sealing under heat and pressure of a heat-sealable polymer adhesive layer to join fins to a laminate. For this reason, rejoinder of this claim and those dependent thereupon is believed to also be appropriate.

In view of the above, Applicant respectfully requests allowance of claims 1-6, 10-14, 16-18, and 20-26 by the Examiner.

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Information Disclosure Statement

An IDS was filed on 2nd November 2009. The Examiner is respectfully requested to initial and return the there enclosed form PTO/SB/08A indicating that the documents have been considered.

Extension of Time

Any extension of time that may be deemed necessary to further the prosecution of this application is hereby requested.

Authorization to Charge Fees

The Commissioner is authorized to charge any additional fees which may be required, or credit any overpayment, to Deposit Account No. 50-5380, referencing the docket number shown above.

Authorization to Communicate via email

Pursuant to MPEP 502.03, authorization is hereby given to the USPTO to communicate with Applicant's representative concerning any subject matter of this

application by electronic mail. I understand that a copy of these communications will be made of record in the application file. Applicant's representative, Coraline J. Haitjema, can be reached at email address haitjemac@hoyngmonegier.com.

The Examiner may also contact the undersigned by telephone at the number given below in order to resolve any questions (note, this telephone number is an Amsterdam phone number, Amsterdam time is 6 hours ahead of US east coast time).

Respectfully submitted,

/cjhaitjema/

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